REMARKS

Claims 7-8, 13-14, and 19-22 were previously cancelled. Claims 1-6, 9-12, and 15-18 are amended. New claims 23-32 are added. No new subject matter has been added. Claims 1-6, 9-12, 15-18, and 23-32 are now pending. Please reconsider allowance of the pending claims in light of the above amendments and following remarks.

New Claims 23-32

New claims 23-32 are added. No new subject matter is present, as the new claims are fully supported by the application as originally filed, for example, by original claims 1-6 and 9-12.

Claim Rejections - 35 USC § 102

Claims 1, 2, 4-6, 9-12, and 15-18 are rejected under the pre-American Inventors Protection Act of 1999 (AIPA) version of 35 USC 102(e) as being anticipated by U.S. Patent No. 5,812,567 to Jeon et al ("Jeon"). The applicant respectfully traverses the rejections.

Claim 1 recites, *inter alia*, a filter modulation signal generator coupled to the wavelength tunable filter. This feature is fully supported by the original application at, e.g., FIG. 1A and FIG. 1B.

In the Advisory Action mailed 19 March 2004, the Examiner has the mistaken idea that the applicants are characterizing the Faraday rotator (52, FIG. 3) of the Jeon reference as the claimed wavelength tunable filter. To the contrary, the applicants clearly and unambiguously stated, in the previous response, that "[I]t is apparently alleged [by the Examiner] that the Faraday rotator disclosed by Jeon (FIG. 3 element 52) is the claimed ***filter modulation signal generating means***." By the express language of claim 1, the claimed "tunable wavelength filter" and the claimed "filter modulation signal generator" are two separate and distinct entities. Thus, the Examiner has apparently confused the claimed "tunable wavelength filter" with the claimed "filter modulation signal generator."

The Examiner states, in the final Office Action mailed 15 October 2003, that FIG. 3 of Jeon shows an acousto-optic tunable filter (111). There is no doubt that Examiner is equating Jeon's acousto-optic tunable filter (111) to the recited "wavelength tunable filter." The Examiner then states that Jeon discloses "a Faraday rotator for controlling the direction of polarization of the beam." Thus, although the Examiner failed to explicitly say so, the Faraday rotator (FIG. 3; numeral 52) is apparently being equated to the claimed "filter modulation signal generator."

The applicants have previously pointed out that it is not possible for the claimed "filter modulation signal generator" to be shown by Jeon's Faraday rotator 52. To the contrary, Jeon teaches (and the Examiner has also agreed in the final Office Action mailed 15 October 2003) that the Faraday rotator 52 is for controlling the direction of polarization of the beam (FIG. 3; column 2, lines 47-49). Thus, Jeon's Faraday rotator 52 is ***not*** the recited ***filter modulation signal generator*** because instead of generating a signal, the Faraday rotator 52 instead controls the direction of polarization of the beam (emphasis added).

Consequently, Jeon does not anticipate claim 1 because it fails to teach the feature of a filter modulation signal generator coupled to the wavelength tunable filter.

Furthermore, claim 1 is directed toward "[a] ***wavelength-swept laser***." The words of a claim must be given their plain meaning unless applicant has provided a clear definition in the specification. MPEP 2111.01, *citing* In re Zletz 893 F.2d 319, 321 (Fed. Cir. 1989). In this case, the applicants have clearly defined a "wavelength-swept laser" as one whose output wavelength continuously varies with time (page 1, lines 13-14).

To the contrary, Jeon consistently teaches that his laser is ***not*** a "wavelength-swept" laser but a "wavelength-tunable" laser (emphasis added). See, e.g., Jeon's title ("***Wavelength Tunable*** Mode-Locking Optical Fiber Laser); column 1, lines 60-62 ("***tunable*** over a broad range"); column 3, lines 20-21 ("laser pulse is ***wavelength tunable***"); column 4, lines 30-32 ("***wavelength tunable*** characteristics ... is achieved by changing the wavelength applied to the acousto-optic tunable filter"); and column 4, line 35 ("a very stable pulse [is achieved]"). Those of ordinary skill in the art know that a "wavelength tunable" laser is one in which the laser output is "tuned" to a consistent and stable output wavelength, meaning an output that ***does not vary with time*** (emphasis added).

Consequently, Jeon does not anticipate claim 1 for the additional reason that it fails to teach the feature of a wavelength-swept laser (MPEP 2131).

Furthermore, claim 1 recites the feature that the wavelength-swept laser is structured to mode lock the short pulsed output by continuously varying the center wavelength of the wavelength tunable filter and by self phase modulation of the light in the non-linear medium. This feature is fully supported by the application as originally filed at, e.g., claim 1 and page 11, line 29-31.

To the contrary, Jeon clearly states that his laser achieves mode-locking by adjusting a polarization of the light wave that is oscillated by the non-linear amplifying loop mirror 101 (column 2, lines 44-47). Jeon's acousto-optic filter has nothing to do with Jeon's mode-locking, that is accomplished by the second polarization controller 22 (column 2, lines 44-

45). Because the applicants' invention achieves mode-locking by continuously varying the center wavelength of the wavelength tunable filter, the applicants' invention requires neither a polarization controller (Jeon's polarization controller 22) nor a nonlinear amplifying loop mirror (Jeon's element 101, FIG. 3) for mode locking.

In regard to the recited feature of "continuously varying the center wavelength of the wavelength tunable filter", the Examiner has previously alleged that this feature is disclosed by the function of Jeon's acousto-optic tunable filter 111 (column 3, lines 25-28). In particular, Jeon states that "the acousto-optic tunable filter 111 not only ***shifts*** the wavelength of propagating light to be continuously varied but also passes the light with the defined spectrum bandwidth" (emphasis added).

The function that Jeon describes is much different than the recited feature of continuously varying the center wavelength of the wavelength tunable filter. Those of ordinary skill in the art know that an acousto-optic tunable filter shifts the optical spectrum in frequency (wavelength) by an amount equal to the acoustic frequency due to the interaction with the acoustic wave. This effect, sometimes called Doppler frequency shift or acousto-optic frequency shift, is well-known in the art. It is this "continuous" frequency shift of the entire optical spectrum that Jeon is referring to, not to the recited feature of continuously varying the center wavelength of the wavelength-tunable filter itself.

To the contrary, as explained above, Jeon cannot teach such a feature because Jeon is directed toward a "wavelength-tunable laser", and not a "wavelength-swept laser". As explained above, a wavelength-swept laser is one whose output wavelength ***continuously varies*** with time. A wavelength tunable laser is one that has an output that is "tuned" to a consistent and stable output wavelength. Jeon explicitly states "the mode-locking laser wavelength with short pulse width ***is tunable*** by changing the wavelength applied to above acousto-optic tunable filter 111" (column 4, lines 40-43; emphasis added). Thus, Jeon may occasionally re-tune his laser to change the output wavelength, but he does not teach continuously varying the output wavelength of the laser with time.

Consequently, Jeon does not anticipate claim 1 for the additional reason that it fails to teach the feature of mode-locking by continuously varying the center wavelength of the wavelength tunable filter (MPEP 2131).

Claims 2-6 and 9-12 are amended for consistency with claim 1. No new subject matter is added. Claims 2-6 and 9-12 inherently contain the features of claim 1. Consequently, Jeon also fails to anticipate claims 2-6 and 9-12 because it does not teach all the features inherent to the claims (see MPEP 2131).

Claim 15 recites, similar to claim 1, continuously varying the center wavelength of the wavelength tunable filter to mode-lock the laser pulses.

Consequently, for the same reason as claim 1, Jeon fails to anticipate claim 15 because it does not teach the feature of mode-locking the laser pulses by continuously varying the center wavelength of the wavelength tunable filter (MPEP 2131).

Claims 16-18 are amended for consistency with claim 15. No new subject matter is added. Claims 16-18 inherently contain the features of claim 15. Consequently, Jeon fails to anticipate claims 16-18 because it does not teach all the features inherent to the claims (see MPEP 2131).

Further in regard to claim 16, Jeon fails to teach the recited feature that a variation speed V of the center wavelength of the wavelength tunable filter is substantially greater than a constant critical speed $Vc = [\ln(r) * \Delta^4]/b^2$. Consequently, Jeon also fails to anticipate claim 16 because it does not show the identical invention in as complete detail as contained in the claim. MPEP 2131, *citing* Richardson v. Suzuki Motor Co., 868 F.2d 1226, 1236 (Fed. Cir. 1990).

Further in regard to claim 17, Jeon fails to teach the recited features of applying an electrical signal to the wavelength tunable filter, and continuously and periodically sweeping, over a predetermined range, at least one selected from the group consisting of a frequency of the electrical signal and a voltage of the electrical signal. Consequently, Jeon also fails to anticipate claim 17 because it does not show the identical invention in as complete detail as contained in the claim. MPEP 2131, *citing* Richardson v. Suzuki Motor Co., 868 F.2d 1226, 1236 (Fed. Cir. 1990).

Further in regard to claim 18, Jeon fails to teach the recited features of superimposing an electrical pulse whose duration time is shorter than the resonator roundtrip time of light over the front portion of each repeating waveform of the electrical signal, thereby tuning pulse generation timing to the electrical pulse as well as helping the generation of optical pulses. Consequently, Jeon also fails to anticipate claim 18 because it does not show the identical invention in as complete detail as contained in the claim. MPEP 2131, *citing* Richardson v. Suzuki Motor Co., 868 F.2d 1226, 1236 (Fed. Cir. 1990).

Claims 23-32 are new. They are similar to claims 1-6 and 9-12, respectively, thus no new subject matter is added.

Similar to claim 1, claim 23 contains the recited features of a ***filter modulation signal generator*** coupled to the wavelength tunable filter; and that the filter modulation signal

generator is structured to produce a ***wavelength-swept laser output*** of a short ***mode-locked*** pulse type by continuously varying the minimum loss center wavelength range of the wavelength tunable filter (emphasis added). It was explained above with respect to claim 1 how Jeon fails to teach each of these three recited features. Consequently, Jeon fails to anticipate claim 23 because it does not show the identical invention in as complete detail as contained in the claim. MPEP 2131, *citing* Richardson v. Suzuki Motor Co., 868 F.2d 1226, 1236 (Fed. Cir. 1990).

Claims 24-32 depend from claim 23. Claims 24-32 inherently contain the features of claim 23. Consequently, Jeon fails to anticipate claims 24-32 because it does not teach each and every feature inherent to the claims (MPEP 21331).

Claim Rejections – 35 USC § 103

Claim 3 is rejected under 35 USC 103(a) as being unpatentable over Jeon in view of USPN 5,469,454 to Delfyett, Jr. (hereafter, "Delfyett"). The applicants respectfully disagree.

Claim 3 depends from claim 1. Claim 1 is not alleged to be non-obvious under 35 USC §103. If an independent claim is nonobvious under 35 USC § 103, then any claim depending therefrom is nonobvious (MPEP 2143.03).

Conclusion

For the foregoing reasons, reconsideration and allowance of claims 1-6, 9-12, 15-18, and 23-32 of the application as amended is requested. Please telephone the undersigned at (503) 222-3613 if it appears that an interview would be helpful in advancing the case.

Respectfully submitted,
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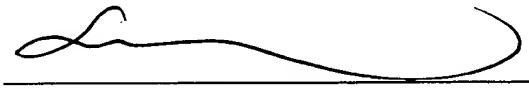

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Limited Recognition Under 37 CFR § 10.9(b)

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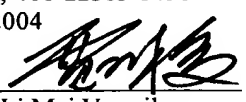

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